This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

Biog
1
R97
1907

iog
1
R97
907

Digitized by Google

3 2044 106 370 158

Digitized by Google

With compliments.

CONTRIBUTIONS FROM THE NEW YORK BOTANICAL GARDEN—No. 100.

SCANDINAVIANS

Who Have Contributed to the Knowledge of the Flora of North America.

By PER AXEL RYDBERG

Biog
LIBRARY OF THE GRAY HERBARIUM
HARVARD UNIVERSITY.
THE GIFT OF
R97
1907
P. A. Rydberg.

NEW YORK
1907.

From the AUGUSTANA LIBRARY PUBLICATIONS. 1907.

Digitized by Google

Digitized by Google

SCANDINAVIANS

Who Have Contributed to the Knowledge of the Flora of North America. *

When we this year celebrate the two hundredth anniversary of the birth of Linnæus, the first questions that suggest themselves to us are: "What did the immortal Swede achieve for botany and zoology, the two sciences he loved so well?", and "Has the work of Linnæus any direct bearing upon the botany and zoology of America?"

The first of these questions has been answered so many times, and will be answered over and over again this spring at hundreds of places where the anniversary will be celebrated. I say hundreds, for there will scarcely be any college or university of any repute, where natural history is taught, throughout the whole world, which will not have a commemorative celebration of some kind; and what would be more natural for a speaker of the day or an *in memoriam* writer to dwell upon than the life work of the man in whose memory the celebration is held. To exploit the achievements of Linnæus will therefore be left in the hands of many abler men than the present writer is.

The second question the writer has been asked to answer in a short address at the celebration to be held here in New York on the 23rd of May. Undoubtedly, it will be answered at more than one place in this country this spring.

When the writer some time ago was asked by Professor J. A. Udden to prepare a "fest-skrift" for the Linné anniversary at Augustana College, Rock Island, Illinois, he hesitated very much whether to accept this honoring invitation or not. He did not know if it would be possible for him in the short time, and with all the busy hours of a curator at an institution such as the New York Botanical Garden, to prepare a memoir creditable to such an oc-

* Reprinted from the Augustana College Library Publications Number VI.

Digitized by Google

casion. At last he dared to undertake the work, and hopes that the institution for which it has been prepared and the anthor's contemporaries in general will receive it as it is, and have forbearance with its shortcomings.

After accepting the invitation, the writer had to choose a subject. As he did not dare to undertake the answering of the first question of the day, because it would have been too hard a task and he would have had too many competitors, and as it was only reluctantly he had agreed to make a short address, in which he would try to answer the second, he hardly knew what to write about. His national pride helped him in choosing the subject, and he will try to answer the question: "Have the Scandinavians contributed anything to the knowledge of the flora of North America?"

Swedes, Norwegians, Danes, Icelanders, and the descendants of Swedes who settled in Finland a few hnndred years ago, are in reality but one nation, although ruled by four different crowned heads. Many of these Scandinavians have chosen, like the present writer, to settle on this side of the Atlantic and to swear allegiance to the stars and stripes. They have not thereby lost their nationality, nor its virtues. As Scandinavians have also been counted a few men of Scandinavian parentage (of the first generation), if this was known to the writer.

With North America the writer understands not only the United States and Canada, but the whole continent north of the Isthmus of Panama and adjacent islands, hence comprising also Mexico, Central America, and the West Indies. This view is the one generally adopted by American botanists, since the acqusition of Porto Rico and the overtaking of the Panama Canal work by the United States. From that time the heaviest work on the flora of these countries has shifted from Europe to America.

When trying to write a sketch of the Scandinavians more or less connected with the history of botany of North America, the writer naturally has to deal with this history and with the history of botany in general. It may not be amiss to state that the history of botany is here taken in a rather narrow sense, including only that of systematic botany, plant geography and related branches, not of plant physiology, nor general morphology, etc.

The best history of botany (or we may say, of botanists) in the library of the New York Botanical Garden is Emil Winckler's

Digitized by Google

Geschichte der Botanik. Unfortunately, this history brings us only up to 1850. Winckler divides the history into the following periods:

The ancient writers.
Medicus—Bauhin, 1478—1601.
Bauhin—Tournefort, 1601—1694.
Tournefort—Linnæus, 1694—1735.
Linnæus—Jussieu, 1735—1789.
Jussieu—R. Brown, 1789—1817.
R. Brown—....., 1817—1850.

Pritzel divides it into the following periods:

Ancient writers.
Tournefort—Linnæus, 1694—1736.
Linnæus—R. Brown, 1736—1810.
R. Brown—DeCandolle, 1810—1824.
De Candolle—....., 1824—.....

These two writers agree in regarding Tournefort, Linnæus, and Robert Brown epoch-making botanists. There is no question that the two first were. As to Robert Brown, there is no doubt that he was one of the greatest systematic botanists the world has produced, and scarcely anyone has known as many plants as he; but as far as the botany of North America is concerned, the writer cannot see that a new epoch began either 1810 or 1817. There are many more reasons for assigning the beginning of new epochs with Jussieu and De Candolle, or rather with the appearance of the works in which they proposed their new systems of classification.

As far as the North American botany is concerned, new epochs apparently began about 1840 and 1890. The beginning of the first of these was too near the time when Winckler and Pritzel wrote, and was naturally overlooked by them.

The writer has adopted in general the periods by Winckler, but with some modification in the later ones.

1. MEDICAN PERIOD, 1478—1601.

This period extends from the time of Medicus to the appearance of Kaspar Bauhin's Pinax. During this time nothing of any value was written on American botany except the work of Hernandez, who traveled in Mexico in 1570—6. Only a portion thereof was published 1615, 1648, 1651, and 1791. So even the publicationof Hernandez's work does not belong to this period.

Nothing was contributed to the knowledge of the American flora by Scandinavians.

Digitized by Google

2. BAUHINIAN PERIOD, 1601—1694.

This period extends from Bauhin's Pinax to Tournefort's Institutiones. The former of these was a remarkable book for its time. It aimed to catalogue and describe all known plants. The names of the plants and the descriptions were of the usual form of the the time. Of course, the work is written in Latin. The names consist of a noun together with a descriptive phrase of one or more adjectives or adjective modifiers. The descriptions are crude, but often as good as were used by the immortal Linnæus himself, 150 years later.

During this period the flora of the West Indies and Mexico was explored and described by Sloane, a noted Irish physician and naturalist, and the Jesuit Barnabas Coba; but nothing was done by Scandinavians.

3. TOURNEFORTIAN PERIOD, 1694—1735.

Tournefort's Institutiones was the epoch-making book. In this appear for the first time botanical genera in their modern sense. Tournefort had in many cases even a clearer idea of generic limitations than Linnæus himself. The majority of the genera in the Genera Plantarum of the latter were adopted from this work of Tournefort. Tournefort's descriptions are about as good as those of Linnæus, and have the advantage of being accompanied by illustrations. What Tournefort's Instiutiones lacked was the systematic arrangement.

During this period the flora of North America was investigated by Plumier, who made four journeys to this continent, W. Houstoun, who collected in the West Indies and Mexico, John Lawson, in Carolina, and M. Catesby, in Virginia, Florida, and the Bahamas.

The first Scandinavian who, as far as the writer knows, contributed to the knowledge of the flora of North America, was Hans Egede, who spent fifteen years as missionary in Greenland. Greenland is not always counted to America, but there is no reason why it should not be. It is much nearer America than Europe. Even botanically it belongs to the former. It is true that it contains many plants common to northern Europe but not found elsewhere in North America, but still it is more American than European. The larger number of plants growing in Greenland are circumpolar ones, i. e. found in America as well as in Europe and Asia. If these are excepted, the flora is decidedly more American than European, especially in the northern part. This is not the case at all with the neighboring Iceland. The latter could be counted geographically to America, but not so botanically. Its flora consists almost exclusively of plants common to it, northern Scotland, northern Scandinavia, Spitzbergen, etc., with a few common to it and Greenland but with no American plants, if the circumpolar ones are excepted.

Digitized by Google

Hans Egede was born at Trondenæs, Norway, the 31st of January, 1686. He served some years as a minister in his native land. He went to Greenland as a missionary in 1721, and stayed there till 1836. He died at Stubbekjöbing on the Island of Falster, Denmark, the 5th of November, 1758. He made a collection of plants, which are still preserved at Copenhagen. After his return from Greenland, he published a very interesting account of the country, its people, fauna and flora, under the title:

Det Gamla Grönlands Nye Perlustration eller Natural-Historia, 1741. (Translated also into French.)

It is claimed that what most tempted Egede to go to Greenland was the idea that he might find there some descendants of the old Norwegian and Icelandic settlers from the time of Leif Ericson. He did not find any Norsemen, although he visited all the places where the old colonies were supposed to have been. The temporal as well as the spiritual welfare of the heathen Greenlander weighed heavily upon his heart. In order to alleviate their wretched condition, he induced a Norwegian company to establish trading posts at several places. After the company had lost one of its best vessels, and as the trading never had been a very paying business, the company decided to withdraw its men and discontinue the trade. This happened in 1726. Egede and his family and a few volunteers remained. Egede sent such a strong plea to the king of Denmark, that in the second year a vessel was sent to Greenland, the Danish government reopened some of the posts, and has carried on from that date a regular communication and continuous commerce with the island.

Paul Egede, son of Hans Egede, was born in 1708, became a missionary to Greenland in 1734, received the title of theological professor in 1761, and that of bishop in 1779. He died in 1789. He has left the following publications:

Herbarium vivum samlet i Grönland ved Colonierne Christianshaab og Godthaab, 1739.

Efterretninger om Grönland, uddragne af en Journal holden fra 1721 til 1788.

4. LINNEAN PERIOD. 1735—1789.

A new epoch began with the appearance of Linnæus's Genera Plantarum. In this Linnæus's new system of classification was used. Before this time there had been no definite system, or there had been used only such crude systems as we sometimes find to-day in some popular books, where, for instance, the plants are

Digitized by Google

classified according to the color of the flowers. Linnæus based his system on the number and different arrangenmet of the stamens and pistils. This was an artificial system, and Linnæus knew it to be so. He once expressly stated that he expected it to be superseded by a more natural one, where the relationship of the plants would be better shown. The Linnean sexual system was and is a very convenient one, and has been used more or less up to our times, where the aim has been to give a key, by the means of which one could quickly determine the names of the plants. That Linnæus saw the natural relationship of plants is shown by the fact that he later gave names to several of our modern families of plants, and that he arranged his artificial system so that several of his classes or orders are practically equivalent to modern families, as for instance the 14th, 19th and 20th classes, and his orders of the 15th and 17th classes.

Another invention of his was the uniform binomial names of the species. This was introduced in his "Species Plantarum" of 1753. Before Linnæus, the botanists, especially since the time of Tournefort, recognized genera in the same sense as we now do, and designated them by Latin nouns In order to designate the species, they added to these nouns descriptive phrases consisting of one or usually several adjectives*, or their equivalents. Linnæus reduced the specific name to one adjective. We find occasionally binomial names in works before Linnæus, but he was the first to use consistently only such names.

By these two systems it was from this time easy to tabulate and arrange the known facts about plants, and it was comparatively easy to find the description of a certain plant; for each genus had a certain place in the system and had only one name, and the species had only one additional name to distinguish it from other species of the same genus, in a similar way as John Smith and Andrew Smith of the same family have different personal names.

During this period many native American botanists explored the country, as John Clayton, John Mitchel, and Thomas Walter the southern states, C. Colden, Jane Colden, William and John Bartram the northern. Many Europeans made extensive travels in this continent, as Patrick Browne, N. J. von Jacquin and Swartz in the West Indics, and Miguel Venegas and A. Menzies on the Pacific coast.

The following Scandinavians made contributions to the knowledge of the North American flora during this period:

A. United States and Canada.

Pehr Kalm was born at Nerpis, Finland, in 1715, and died as professor at the University of Åbo, the 16th of November, 1779.

In the seventeen hundred and nineties, Baron Sten Carl Bjelke, then the vice president of the court of appeals (hofrätten) of Finland, proposed to the Royal Swedish Academy of Sciences at

* An illustration of the difference in the nomenclature of Linnæus and that of his predecessors is found below on page 12 in the citation from Kalm, in which the latter first gives the old way of naming the plant, named after him, and the Linnean way, viz., *Kalmia latifolia*.

Digitized by Google

Stockholm to send a botanist to Siberia and Iceland, which are on the same latitude as a part of Sweden, to collect seeds of plants as would "improve the Swedish husbandry, gardening, manufactures, arts, and sciences." Dr. Linnæus suggested that North America would be a better country than either. About the same time a Captain Triewald gave in Stockholm an exhibition and lecture on his observations on silk-culture. As Linnæus had described a species of mulberry* from North America and native of a climate similar to that of Sweden, this gave additional strength to the choice of North America. When Count Tessin, who could nearly always have his own way, and who was in favor of the project, became president of the Royal Academy, it was decided to send Professor Kalm. An appeal was sent to the three universities of Sweden, at Upsala, Lund, and Åbo, to contribute what they could for the advancement of science. Åbo was the first one to answer, and sent a small sum, Lund had nothing to spare, but Upsala contributed liberally, considering the times and the country. Now-a-days, $450 seem to us rather a small sum. With the countributions from other sources, the fund amounted to about twice that sum. Professor Kalm, however, spent not only this and his own salary, but about $650 of his own money, and the journey left him with very limited means for the rest of his life.

After passports had been secured from the courts of London, Paris, Madrid, and the Hague, Kalm sailed from Gothenburg the 11th of December, 1747, accompanied by Lars Jungström, a gardener by profession. Overtaken by a severe storm, the vessel had to put in at Grimstad, Norway, where the travelers had to stay till the 8th of February, 1748. They arrived at London the 17th of the same month, stayed in England till August 15, and arrived at Philadelphia the 26th of September.

In Philadelphia Kalm stayed about a month, and made there the acquaintance of John Bartram, the most prominent American naturalist at that time. Then he set out on a journey to New York, passing through New Frankfort, New Bristol, Pa., Burlington, N. J., then the residence of the governor, Trenton, "Prince-town", New Brunswick, and Elizabeth, returning to Philadelphia Nov. 5.

In November he visited Racoon, N. J., where a number of

* This was *Morus rubra* L., which can be grown in southern Sweden, but, unfortunately, thi species is not well adapted to silk-culture.

Digitized by Google

Swedes lived. Kalm afterward published three volumes on his travels. In these he describes very minutely everything he saw, the people, their industries and customs, the conditions and nature of the country through which he traveled. Of the animals and plants he met with, he gave only short descriptions, as he intended to publish these more extensively in a scientific work in Latin. In the diary of his stay in Racoon, he describes what the Swedes called the spoon-tree, because the Indians were said to make spoons from its wood. Kalm adds: "The English call this tree Laurel, because its leaves resemble those of the *Laurocerasus*. Dr. Linnæus, conformable to the peculiar friendship and goodness with which he has always honored me, has been pleased to call this tree, *Kalmia foliis ovatis, corymbis terminalibus* or *Kalmia latifolia*."

With the exception of a few days spent on a revisit to Philadelphia and a short visit to Penn's Neck, Kalm staid at Racoon the whole time till May 21, 1749. From June 3 to June 10 he was in New York. From there he sailed in a yacht to Albany. From there he traveled through Saratoga, Fort Nicholson, Fort Anne, Fort St. Frederic, Fort St. John, and Prairie de la Magdelene to Montreal, at which place he arrived on the 24th of July. He arrived at Quebec the 5th of August, visited several neighboring places, and returned to Montreal the 15th of September.

The three volumes of his "En resa till Norra Amerika" describes his travels up to this period. Evidently he intended to publish the account of the remainder of his stay in North America, but it was never done, probably on account of lack of funds. In the preface is given a synopsis of his travels. From this we find that he returned to Philadelphia the same fall. In 1750 he visited western Pennsylvania and the shores of New Jersey. After this he undertook his second long journey, through New York, the Blue Mountains, to Albany, then along the Mohawk River, visited the Iroquois Indian nations, the Mohawks, Oneidas, Tuskaroras, Onandagas, and Kayugas, saw the shores of Lake Ontario and Niagara Falls, and returned to Philadelphia in October. In a letter to Bartram he has given a vivid and most interesting description of his impressions at Niagara.

In 1751 he returned home by the way of England, and arrived at Gothenburg on the 16th of May. He resumed his duties as professor at the University of Åbo. In his private little garden

Digitized by Google

he raised many of the seeds he had gathered, and many more were cultivated in the Botanical Garden at Upsala. As stated before, he published:

En resa till Norra Amerika (A Journey to North America), in 3 volumes, 1853—'61. [This has been translated into German and English, and is one of the best accounts of this country at that period.]

Norra Amerikanska färge-örter, published in 1763.

He intended to publish a larger descriptive work on the plants and animals he met with on his journey, but this was never done, very likely because he had spent all his funds. All, or at least most of his plants were published by Linnæus in his "Species Plantarum."

Carolus Linnaeus or CARL VON LINNÈ was born at Råshult, Småland, Sweden, the 13th of May (old style), 1707, and died at Upsala the 10th of January, 1778. There is no need of going into details of his life-history, for it will be given extensively over and over again this year. Only a few words may be given to show his work on American botany. I shall give it more extensively elsewhere.

He became acquainted with the North American plants from the finely illustrated works of Plumier, Plukenet, Catesby, Sloane, and Gronovius; also those of Petiver, Morrison, and Cornuti. Through Gronovius he had a chance to see Clayton's collection. Sloane's and Catesby's plants he saw on his visit to England. He described himself the plants collected by Kalm. A few American plants were already under cultivation. These were all incorporated in the first edition of "Species Plantarum." He afterwards received plants from Barthram and from Colden and his daughter Jane. He corresponded with John Ellis, a resident in the West Indies, and Dr. Gardner, who botanized in Carolina and Florida. Later he purchased a set of West Indian plants collected by Patrick Browne, and received a part of Jacquin's collections through exchange. These were described in the 10th edition of his "Systema Naturæ" and in the 2nd edition of "Species Plantarum." In all, he described about 2,000 North American plants.

The works which in part bear on North American botany are:

Species Plantarum, 1753; Edition 2, 1762—'63.

Systema Naturæ, Ed. 10, 1758—'59.

Daniel Carl Solander was born the 12th of February, 1733, at Piteå, Sweden. In 1759 he moved to England, and became libra-

Digitized by Google

rian of the British Museum in 1765. Solander died in London the 13th of May, 1782. Together with Banks, he was a botanist on Captain F. Cook's first voyage around the world in 1768—'71. As a result of this journey the following scientific work was published by the trustees of the British Museum in 1900—'05: Illustrations of the Botany of Captain Cook's first voyage around the world. Solander also helped Aiton in publishing:

Hortus Kewensis, 1789.

In this Solander has contributed the descriptions of many new plants from America as well as elsewhere. Six of the new genera published in Swartz's West Indian flora are really from Solander's hand, as Swartz found the descriptions as well as the names in Solander's manuscript in the Banksian herbarium.

B. Greenland and Arctic America.

Many of the men in charge of the Danish trading posts in Greenland, established at the instigation of Hans Egede, and many of the sea captains engaged in the trade on Greenland or whaling near its coasts, brought home botanical specimens. One of the earlier and the most important of these was,

Carl Peter Holböll, who was born at Copenhagen the 31st of December, 1795. In 1821 he was appointed lieutenant in the marine, and some years later captain and governor of one of the colonies in Greenland. After his return to Denmark, he sailed in 1856 to revisit Greenland, and neither he nor his vessel was ever heard from. He was interested in both zoology and botany, and published an article on the birds of Greenland. His collection of plants is at the botanical museum at Copenhagen. At least one plant, *Arabis Holboellii* of the mustard family, is named after him.

The plants from the older of these collections, as well as those made by Egede and his son, were mostly described in the splendid work that bears the name *Flora Danica.* It is a large folio in sixteen volumes, and was intended to figure every plant growing in the kingdom of Denmark and its possessions. It includes, therefore, Norway, Faroe Islands, Iceland, Greenland, Schleswig-Holstein, and Oldenburg, which all at some time have belonged to Denmark. It was begun in 1764 by Öder, and was concluded in 1871.

Digitized by Google

Georg Christian Öder was born at Anspach, Germany, the ird of February, 1728. He took the degree of doctor of medicine n 1749, later moved to Denmark, where he was appointed profes- or at the University of Copenhagen in 1754, became "Stiftsamt- aan" at Drontheim, Norway, in 1773, moved to Oldenburg in 773, where died the 28th of January, 1791.

His most prominent botanical work was the above mentioned *Flora Danica*, of which he published the first three volumes. These ontain a large number of Greenland plants.

Christen Friis Rottböll was born at Hörby, Zealand, Denmark, he 3rd of April 1727, became doctor of medicine in 1755, rofessor in 1756, and director of the botanical garden in Copen- agen in 1776. He died in Copenhagen the 15th of June, 1797.

The only article from his hand that bears directly on Ameri- an botany is,

Afhandling om en Deel rare Planter, som i Island og Grönland ere fundne, etc. 770.

Anders Johan Retzius was born at Christianstad, Sweden, he 3rd of October, 1742, became doctor of philosophy in 1766, nd was professor at the University of Lund 1777—1812. He lied at Stockholm the 6th of October, 1821. Linnæus, Læsta- lius, Wahlenberg, and Retzius are those of the older botanists who lid the most to make the flora of Lapland known. They therefore aid the foundation to the knowledge of the Arctic vegetation in eneral. Among other botanical works he published the follow- ng, which also included Greenland:

Flora Scandinaviæ Prodromus, 1779 [together with two supplements].

C. West Indies and Central America.

Carolus Linnaeus (See above).

Carl Gustaf Sandmark, a pupil of Linnæus, wrote a disser- ation which was based on a collection secured by Linnæus from P. Browne. In reality this did not contain anything new, as the pecies had already been described in "Systema Naturæ" by Lin- æus. The only value Sandmark's dissertation has is that it ives more extensive descriptions.

Flora Jamaicensis, 1759.

Gabriel Elmgren, also a disciple of Linnæus, wrote a disser- ation based on the same collection of P. Browne. What is said

Digitized by Google

of Sandmark's dissertation, applies also to this. Elmgren's wor however, contains many species not found in Linnæus' "Systema Three of these are accompanied by descriptions and belong t right to Elmgren, although they as a rule have been credited t Linnæus.

Plantarum Jamaicensium pugillus, 1759.

Daniel Carl Solander (See above).

Carl von Linné, f., the son of the immortal Linnæus, wa born at Falun, Sweden, the 20th of January, 1741, became pr fessor of medicine in 1763, and died at Upsala the 1st of Nove ber, 1783.

As far as the writer knows, he published only a few Centr American plants collected by Mutis.

Supplementum Plantarum Systematis vegetabilium, 1781.

Olof Swartz was born at Norrköping, Sweden, the 21st September, 1760. His father, whose name was also Olof Swart was a factory owner and a man of some means. This fact ma the son independent and able to spend money both in travels a in publishing his works. Olof Swartz was a pupil of Carl v Linné, the younger. As a student he showed such ability that h teacher said of him: "*Botanices studiosus optimæ spei.*" In 178 and 1783 he took the two preliminary examinations then requir for the degree of doctor of medicine. During the summers of th period he undertook several botanical expeditions to differe provinces of Sweden and made several new discoveries.

Swartz had for some time contemplated making a journe into the tropics, and in 1783 he was ready to go. He went o board the 5th of August, and sailed in a merchant vessel to Bo ton, where he landed the 3rd of October. He did not intend t stay there, but took the first opportunity offered him to go t Jamaica. He left Boston on the 26th of November and landed i Montego Bay on the 5th of January, 1784. He set to wor with an untiring zeal to make as thorough a survey of the natur history of the island as possible. Not long after his arrival h was invited to remain as government botanist, but he declined In 1785 he spent a few months in Cuba and San Domingo, an returned to Jamaica. According to Wikström, he also visite Porto Rico, but this is denied by Urban.

In 1786 Swartz went to England to compare his collection

Digitized by Google

ith the Linnæan and Banksian herbaria there. During his stay e was offered another position, viz., to go to India as physician f the East India Company; but he declined, having decided to erve his own native country. His collections were very rich, and is *Flora Indiæ Occidentalis*, the ultimate result of his travels nd labor, is the foundation of our knowledge of the flora of the Vest Indies. It contains the descriptions of 892 species of plants.)f these 723 were new to science.

After his return to Sweden, Swartz continued his botanical xplorations in different parts of Sweden. In 1802 he was called o become the successor of Prof. Lepechin as director of the Royal cademy of Sciences at St. Petersburg, but again he declined. He vas appointed director of the Royal Academy at Stockholm in 807, made a knight of the Order of Vasa in 1908, and professor)f the Royal Carolinian Medico-Chirurgic Institute at Stockholm n 1814. He died the 19th of September, 1818.

Swartz's knowledge of American plants, however, was not imited to his own collections. While in England, he studied the ollections found in the herbaria of Sloane, Plukenet, Petiver, and Banks. He corresponded freely with such men as Schreber, Willdeiow, Schræder, Persoon, Mohr, Hooker, and Fischer, the promiient botanists of his time. He received from Rev. Muhlenberg in Pennsylvania a fine collection of American plants collected in 1710 and 1711. From these he described six new species of nosses.

In 1817 Rev. Forström, then residing on the island St. Barholomew, sent him a large collection of Antillian plants. These urnished the material for his "Flora Bartholomensis et Guadaoupensis", containing 34 new species.

He was an acknowledged authority on ferns, mosses, and ichens. He was the father of fern-knowledge; his *Synopsis Filicum* made a revolution in that science. He was one of the first to adopt and apply the system of genera and species of mosses by Hedwig, the father of bryology, and he knew almost as much about lichens as his friend Acharius. In his books on these three classes of plants are found numerous descriptions of North American plants.

The following publications from Schwartz's pen refer wholly or partly to North American plants:

Digitized by Google

Tolf nya slag af Urticæ-släktet från Vestindien, 1787.

Beskrifning på nio nässlor (*Urtica*), hvilka nyligen på Jamaica blifvit upp täckta och beskrifna af O. Swartz, 1787.

Nova Genera et Species Plantarum, etc., 1788.

Cinchona augustifolia, en okänd växt från Västindien, 1788.

Solandra, ett nytt släkte från Västindien, 1788.

Quassia excelsa, en ny växt från Västindien, 1788.

Stylanthus, ett nytt örtsläkte, 1788.

Observationes botanicæ quibus plantæ Indiæ occidentalis, 1791.

Icones plantarum incognitarum quas in India occidentale delexit atque del neavit, 1794.

Flora Indiæ occidentalis aucta atque illustrata, etc., 1797—1806.

Synopsis Filicum, 1806.

Lichenes Americani, 1811.

Flora Bartholomensis et Guadaloupensis. 1825 & 1827.

5. JUSSIEUAN PERIOD, 1789—1819.

This period begins with the publication of the *Genera Plantarum secundu ordines naturales disposita* by Antoine L. de Jussieu. In this appears for the firs time a system of classification based on the natural relationship of the plant This system was in reality founded by his uncle, Bernard de Jussieu, but neve published. The system was much more natural than the sexual system of Lin næus, but was also much more complicated. As it had many inconsistencies, an as there was no uniformity in the names of the families, it did not receive the ad herents that it deserved, and there are few books in which we find it used durin this period. Even if the Jussieuan system of classification did not leave deepe marks on the period which bears its name, it is evident that a new era began a this time, a very active one, especially in systematic botany, with such systemat ists as Willdenow, Aiton, Salisbury, Persoon, Sprengel, and Robert Brown, th latter, however, belonging just as much to the next period.

Before this time nothing had been published that exclusively treated on Nort America except Walter's "Flora Caroliniana", which appeared the year befor Jussieu's "Genera"- During this period were published all the older floras of thi country, viz., those of Michaux, Pursh, Barton, and Bigelow, and Nuttall's "Gen era". Elliott's work was published a few years after the beginning of the next H. Muhlenberg and C. C. Robin belonged to this time. Lewis and Clark mad their famous expedition across the continent, A. Poiteau, John Lunan, and G Richard de Tussac explored the West Indies, David Cranz, a Moravian missio nary, collected in Greenland, and another one of the same creed, Kolmeister, i Labrador.

The following Scandinavians partook in the work; none of them, however, contributed anything important to the knowledge of the flora of the continent. Their work was mostly limited to the West Indies.

A. West Indies.

John Ryan was a planter on St. Croix. When and where he was born and when he died, I have not been able to ascertain, but

Digitized by Google

e was a contemporary of Vahl's. He made several journeys to ifferent parts of the West Indian islands and to Surinam and razil. He corresponded with and sent numerous specimens to ahl.

Julius Philip Benjamin von Rohr, an officer of the garrison f the Danish West Indies, served from 1757 as civil engineer, and om 1765 as superintendent of constructions at the government uildings and forts. In 1787—'91 he made a series of journeys in he interests of cotton culture, and died as lieutenant colonel in 793, on a journey from North America to Guinea. He was an rdent collector, and described 8 new genera of plants from St. roix, Montserrat, Guadeloupe, and Martinique. His collections ere afterwards elaborated by Vahl. At least one publication is om his hand:

Plante-Slægter med tilföiede Anmærkninger af Hr Professor Vahl, 1792.

Hans West was born in 1758 at Mesinge, on Hindsholm, Fyen, enmark. In 1788—1800 he was the president of the school t Christianssted on St. Croix. In 1802 he was appointed minis- er to Holland, and died at Cassel, returning from a journey to rance 1811. He made in the Danish West Indies and Porto Rico xtensive collections, which were sent to Vahl. He published the llowing, a work of 363 pages:

Bidrag til Beskrivelse over Ste. Croix, med en kort Udsigt over St. Thomas, t. Jean, Tortola, Spanishtown og Crabeneiland, 1793. [Several new species are here published].

Martin Vahl was born at Bergen, Norway, the 10th of Octo- er, 1749. He became lector at the Botanical Garden at Copen- agen in 1779; director of the Botanical Garden in 1800; profes- t the university in 1801, and died the 24th of December, 1804. He studied under Linnæus in 1769—'75, and edited *Flora Danica,* ols. 6 and 7, in 1787—1803. He was specially interested in the ora of the West Indies. The plants he described were collected by on Rohr at St. Croix, Monserrat, Guadeloupe, and Martinique; by r. Ryan at Monserrat, St. Croix, and St. John; by Hans West on he Danish West Indies; by Mertfelt on Guadeloupe, and Dr. Pflug n St. Croix.

The following, referring to American plants, are from him:

Flora Danica, Vols. 6 and 7, 1787—1803.

Eclogæ Americanæ, 1796—1807.

En deel Kryptogamiske Planter fra St. Croix, 1802.

Digitized by Google

Om Slægtet *Cinchona* og dens Arter, 1797.

Icones illustration, plantarum Americanarum in Eclogis descriptarum inse vientes, 1798—'99.

Anmærkninger til Oberst-lieutenant von Rohrs Beskrivelse over nogle Pla ter, 1793.

Beskrivning over *Stellaria Grœnlandica* og *Dryas integrifolia*, 1797.

Samuel Fahlberg, a Swedish physician, came to St. Bartho omew in 1785, soon after that island had become a Swedish po session. He published:

Utdrag af samlingar till naturalhistorien öfver ön St. Barthelemi i Västind en, 1786.

Bengt Anders Euphrasen, a botanical student, undertook i 1788 a journey to the West Indies under the auspices of the Roy Swedish Academy of Sciences, and visited St. Bartholomew, S Eustatius, and St. Kitts. After his return he published:

Beskrifning öfver svenska västindiska ön St. Barthelemi samt öarne St. Eu tache och St. Christopher, 1795.

Paul Erdman Isert was born in 1757, and in 1783 went ou as head physician of the Danish Colonies in Guinea, which he le in 1787 and sailed in a slave-ship to the West Indies. He visite St. Croix, St. Thomas, St. John, St. Eustatius, Guadeloupe, an Martinique. He returned to Copenhagen, where he died in 178 He published:

Reise nach Guinea und den Caraibischen Inseln im Columbien, 1788,

Rev. Forström. Nothing more is known to the writer tha that he was a Swedish clergyman residing on the island of S Bartholomew, and sent a large collection to Swartz in 1817.

Olof Swartz (See preceding period.)

6. CANDOLLEAN PERIOD, 1819—1840.

This period began, in the writer's opinion, rather with the appearance of t second edition of Augustine Pyramus de Candolle's *Theorie elementaire de la Bo nique* in 1819, than with that of the first volume of his "Prodromus", in 182 for the epoch-making publication was the publication of his system of classific tion. It is true that his system had already been published in 1813 in the fir edition of the "Theorie;" but it received considerable modifications in the seco edition, where it is practically as we know it to-day.

De Candolle's system was based to a great extent on that of Jussieu; but n only had the related genera been brought together into families, but the relat families into orders, and arranged in a series. Except in a few cases, he h formed the name of each family from the name of a representative genus belon ing to it by suffixing the ending *-aceæ*, as, for instance, *Rosaceæ* from *Rosa*. H

Digitized by Google

system was adopted almost immediately by the leading botanists of the world, and the Natural System has from that time prevailed over the artificial Sexual System of Linnæus.

Before this time nearly all botanical publications relative to the flora of North America had been made by foreigners. From this time on, at least as far as the United States and Canada are concerned, the bulk of the published works is from the hands of native Americans. During this period lived here the following botanists: Nuttall, A. Eaton, Schweinitz, Barton, Rafinesque-Schmaltz, Torrey, Beck, Riddell, Engelmann, Darlington, Elliott, and Gray. Douglas and Drummond made their trips across the continent. E. Meyer explored Labrador; de la Pylaie Canada; Scoresby, Ross, Parry, and Richardson the Arctic regions; Maycock, Ehrenberg, and Macfadyen the West Indies; Llave, Lexarza, Schiede, Deppe, Moricand, Hartweg, and Ehrenberg Mexico.

None of the Scandinavian botanists visited the northern part of the continent proper, and none wrote specially on the flora of the United States or Canada; but two of the most prominent Swedish botanists published works in which numerous North American plants are described. These were:

Carl Adolf Agardh was born at Båstad, Sweden, the 23rd of January, 1785, received his Ph. D. in 1805, became docent at Lund in 1807 and professor in 1812, was appointed bishop of Karlstad, where he died the 28th of January, 1859. He was an ardent student of sea-weeds, and can be called the father of algology. His work was continued by his son, Jacob Georg. The elder Agardh has, as far as the writer knows, published nothing that bears exclusively on American botany; but in his principal works he describes many American plants. These works are:

Species algorum, 1820.
Systema algorum, 1824.

Elias Magnus Fries was born at Femsjö, Småland, Sweden, the 15th of August, 1792, received his Ph. D. degree in 1814, became docent at Upsala in 1814, and professor and director of the Botanical Garden in 1851—'63. He died at Upsala the 8th of February, 1878. The place Agardh held in algology, Fries can be said with fully as good a right to have held in mycology. It is especially the higher fungi, and above all the *Hymenomycetes*, which have been treated with a master's hand by him. In his large works we find many American species described, and still more that are common to the Old and the New World.

Systema mycologicum, sistens fungorum ordines, genera et species, 1821—'29. With a supplement, 1830—'32.

Digitized by Google

B. Greenland and Arctic America.

With the nineteenth century began an active period in the investigation of polar regions. It was especially Arctic America that was an object for explorations. During this time Sabine, Ross, Parry, and Franklin undertook their famous expeditions. The following Danes added not a little to the knowledge of the flora of Greenland and the neighboring islands. The first one belongs rather to the preceding period, but is included here, as his work is closely connected with the work done later.

Captain Morten Wormskjöld was born at Copenhagen the 16th of January, 1783. He made a journey to Greenland in 1812—'14, and another around the world in 1815—'19, resided in Kamtschatka 1816—'18, and died in Gaunö, Denmark, in 1845. He brought home a fine collection of plants. At least one American plant is named after him, *Veronica Wormskjoldii*, which grows in Greenland and Arctic America as well as in the Rocky Mountains.

Count Raben made a journey to Greenland in 1823 and brought home a collection, which was determined by Hornemann.

Wilhelm August Graah was born the 24th of October, 1793, and died in 1863. He made several journeys to Greenland, the first in 1823. On his third journey, 1828—'31, he wintered at Nanolatic, Nubarbik, and Julianehaab. He was director of the Greenland Company in 1832—'50, and appointed captain in 1840.

Undersögelse Reise til Ostkysten af Grönland, 1832.
Expedition to Search for the Lost Colonies on the East Coast of Greenland.

Jens Lorenz Mustue Vahl, son of M. Vahl, was born the 27th of November, 1796, was for a long time librarian of the Botanical Garden at Copenhagen, and died the 12th of november, 1854. Vahl traveled in Sweden, Germany, Austria, France, and Spitzbergen. He made one journey to Iceland and another to Greenland in 1828—'36. From his hand is the following publication:

Voyage en Island et au Grœnland, 1841.

He also contributed to *Flora Danica* and to "Naturhistoriske Bidrag til en Beskrivelse af Grönland" by Rink.

Hans Christian Lyngbye was born at Blendstrup, Denmark, the 29th of June, 1782. He was a minister of the gospel, and died at Söeborg the 18th of May, 1837. He was especially

Digitized by Google

interested in water plants; contributed to *Flora Danica*, and is the author of

Tentamen Hydrophytologiæ Danicæ [which also included Greenland], 1819.

Jens Wilken Hornemann was born at Marstal, Aerö, Denmark, the 6th of March, 1770, received the honorary degree of Ph. D. in 1836, was professor of the university of Copenhagen 1808—'39, and died in Copenhagen in 1841. He was one of Denmark's most prominent systematic botanists, and added much to the knowledge of the flora of Scandinavia. He determined the collections made by Count Raben, Captain Graah, and others. Besides, he published the following works which contain descriptions of North American plants:

Dansk Oekonomisk Plantelære, 1837.

Hortus botanicus Hafniensis, 1813—'15.

Bemärkninger om Vegetationen i Grönland samt nogle der af Wormskjöld og Gieseke fundne sjeldne Planter, 1815.

Om Grönlands flora, 1832.

Flora Danica, Vols. 8—13, 1810—'40.

C. West Indies.

Peder Eggert Benson was born at Vesterskov on Lolland, Denmark, the 27th of October, 1788. He took his pharmaceutical examination in 1814, and arrived at St. Croix in 1817, where he practiced as apothecary. In 1822 he was elected superintendent of the natural history collections made by the order of the government. In 1848 he returned to Copenhagen, where he died the 24th of July, the same year. He made large collections which were sent to Copenhagen, and carried on an extensive correspondence, especially with Hornemann.

Om den vestindiske Salop, dens Dyrkning, Tilberedelse og almindelige Egenskaber, 1823.

Peter Raben was born in Dröbak, Norway. In 1816 he took his chirurgical examination and became ship-surgeon on a Danish man-of-war. As such he visited, as early as 1820, the Danish West Indies and Porto Rico. In 1830 he became surgeon of the garrison on St. Thomas, and died in 1839. He collected plants in the Danish West Indies, Crab Island (Vieques), and Curacao. Although a man of poor health, he made large collections and corresponded with Prof. A. P. Candolle at Geneva and Prof. Horneman at Copenhagen.

Digitized by Google

Hans Baltsar Hornbeck was born the 9th of January, 1800, at Copenhagen. In 1829 he took his chirurgical examination, and went out the same year as ship-surgeon on the government vessel "Diana", to the West Indies. Two years later he took his examination as doctor of medicine and moved to St. John as practicing physician. He returned to Denmark in 1844, and died in 1870. He was an ardent collector, and corresponded much with Prof. Schouw in Copenhagen.

Johan Emanuel Wikström was born at Venersborg, Sweden, the 1st of November, 1789, became doctor of medicine in 1817, and was director of the Botanical Museum at Stockholm in 1818—'56. He died the 4th of May, 1856. For many years he published "Öfversigt af Svenska Vetenskapsakademiens handlingar." There are numerous publications from his hand, but only the following, as far as the writer knows, refer to American botany. They were principally based on the collections made by Dr. Fahlberg, Euphrasen, Richard, l'Herminier, Bertero, and Forström.

Öfversigt af ön Sanct Barthelemis flora (6 new species), 1826.

Öfversigt af ön Guadeloupes flora (21 new species), 1828.

Enumeration of Plants of St. Eustache and Saba.

Den amerikanska Agaves eller den så kallade hundraåriga aloens naturalhistoria.

6. HOOKERIAN PERIOD, 1840—1889.

The appearance of Hooker's *Flora Boreali-Americana*, 1829—'40, and about the same time of Torrey and Gray's *Flora of North America*, 1838—'43, marks the beginning or rather the end of a period, at least as far as North American botany is concerned. These two books represent the work done during the Candollean period of two decennia of most active work. The new period was also an active one, for during this were undertaken the botanical explorations connected with the Mexican boundary survey, the Pacific Railroad surveys and Hayden's geological surveys. Nuttall, Torrey, and Engelmann were still at work during the earlier part. C. C. Parry, Hall and Harbour, Bigelow, Watson, Thurber, Wolf, Porter, Coulter, Palmer, Brandegee, Lemmon, Bolander, Kellogg, Greene, etc., were exploring the West; Palmer and Pringle began their work in Mexico, and the Macouns, father and son, theirs in Canada. The systematic part, at least on the flowering plants, passed over almost exclusively to one institution, viz. Harvard, where Gray was the leading spirit.

Bentham and Hooker's *Genera Plantarum*, in which was inaugurated modifications and improvements on the Candollean system of classification, appeared about the middle of this period, 1862—'83. It would hardly be advisable to assign as the beginning of a new period the time when this appeared; for the "Bentham-Hookerian system" differs in no essential respect from that of De Candolle

Digitized by Google

and had little effect on botany at large. The "Genera", however, have been of inestimable value, for no work contains such good and complete descriptions of the genera of the world as this.

The following work was done by Scandinavians during this period:

A. United States and Canada.

Thure Ludwig Theodor Kumlien was born at Herrlunda, Västergötland, Sweden, the 9th of November, 1819, graduated at Skara Gymnasium, and was for some time a pupil of Elias Fries at Upsala. He emigrated to America in 1843 and settled near Lake Koshkonong, Wis. For twenty years he made collections for the museums at Upsala, Stockholm, Leyden, the British Museum, and the Smithsonian. He was a zoologist as well as a botanist, and a great lover of nature. In 1867 he became instructor in botany and zoology at Albion College, and in 1883 conservator of the Milwaukee Public Museum. He died the 5th of August, 1888. He published very little. The only botanical publication, as far as the writer knows, is the following:

On the Rapid Disappearance of Wisconsin Wild Flowers, 1876.

Jacob Georg Agardh, son of C. A. AGARDH, was born at Lund, Sweden, the 8th of December, 1813, received his Ph. D. degree in 1832, became docent at Lund in 1834, extra-ordinary professor in 1847, and professor in 1854, retired in 1879, and died the 17th of January, 1901. He was one of the most prominent phycologists in the world, and specialized in the marine algæ, especially the red sea-weeds. He has written little that bears directly on American botany, but his principal work, "Species, genera et ordines Algarum", comprises the whole world, and therefore contains many American plants. The first one given below contains more North American species than exotic ones. The following are from his hand:

Synopsis generis Lupini, 1835.
Nya alger från Mexico, 1847.
Species, genera et ordines algarum, 1848–'63.
Bidrag till kännedom af Grönlands Laminarier och Fucaceer, 1872.
Till algernas systematik, 1872—'90.
Grönlands Floridier och Ulvaceer.

Nils Johan Anderson was born at Gärderum, Småland, Sweden, the 20th of February, 1821, received his Ph. D. degree in 1845, was lector at the Gymnasium of Stockholm in 1851—'53, and director of the Botanical Museum in 1856—'79. He died

Digitized by Google

March 27, 1880. In 1851—'53 he was the botanist of the journey around the world of the Swedish man-of-war Eugenie, on which tour the Galapago Islands were especially studied. Anderson was the most prominent salicologist of his time, and numerous willows from America as well as elsewhere have been described and named by him. The works from his hand that bear on North American botany are the following:

Salices boreali-americanæ, A Synopsis of the American Willows, 1858.
Monographia Salicum hucusque cognitarum, 1867.
Salicaceæ in De Candolle's Prodromus, 1868.

Vett Brecher Wittrock was born at Holm, Dalsland, Sweden, the 5th of May, 1839, received the degree of Ph. D. in 1866, was appointed docent at Upsala the same year, and professor in 1878. The following year he became director of the Botanical Garden at Stockholm. He is a prominent algologist and a specialist on green algæ. The following publications refer more or less to American plants:

Algologiska studier, 1867.
On the Development and the Systematic Arrangement of the *Pithophoraceæ*, a new order of Algæ [all Tropical, some West Indian], 1877.
Prodromus Oedogoniorum, 1874.

Sextus Otto Lindberg was born at Stockholm the 29th of March, 1835, received his Ph. D. in 1865, and became professor and director of the Botanical Garden at Helsingfors, Finland, in 1865. He died there the 20th of February, 1889. He was one of the most prominent bryologists of the world, and is the author of a new system of arrangement of the genera and species of mosses. Works that bear directly on the North American flora are the following:

Revisio critica iconum in opere Flora Danica muscos illustrantium, 1871.
Europas och Nord-Amerikas hvitmossor, 1882.

B. Greenland and Arctic America.

In 1870 began a series of expeditions to Greenland and other parts of Arctic America; but before this time several collections had been sent to Copenhagen by men who had made longer or shorter stays in Greenland. The most important of these were made by

Captain Norman,

Dr. L. Schiödte, who was a physician at Ivigtut in 1867, and by

Digitized by Google

Henrik Johannes Rink, who was born in Copenhagen the 26th of August, 1819, received his degree of Ph. D. in 1844, made a journey around the world in 1845—'47, one to northern Greenland in 1848—'51, and another to southern Greenland in 1852—'68. Dr. Rink was governor of the colonies at Julienhaab and Godthaab in 1853, became general inspector of South Greenland in 1858—'68, and one of the three directors of the government explorations of Greenland in 1871—'82. He died at Christiania in 1893. He published contributions as follows:

Grönland, geographisk og statistisk beskrevet, 1852—'57. [Natural history contributions to this were made by J. Reinhart, J. C. Schiödte, O. A. L. Mörch, C. Luetken, and J. Lange (See below.).]

Greenland, 1877. [The botanical account in this was by R. Brown (Campst.) and J. Lange.]

Salomon Thomas Nicolai Drejer was born at Eveldrup, Viborg, Denmark, the 15th of February, 1813, became docent at the university in 1839, and died at Copenhagen the 21st of April, 1842. He was an acknowledged authority on sedges, especially the genus *Carex*. He described numerous new species of this genus, of which not a few are found in America. The most important work from his hand is

Revisio critica Caricum borealium in terris sub imperio Danico jacentibus inventarum, 1841.

In 1870 and 1871 two Swedish expeditions were made to Greenland under Prof. Nordenskiöld. The botanist of the first expedition was S. Berggren; of the second, T. E. Fries.

Sven Berggren was born at Hör, Skåne, Sweden, the 12th of August, 1837, received his Ph. D. degree in 1865, became docent in 1866, extra ordinary professor at Upsala in 1881, and professor at Lund in 1898. He made a journey to Spitzbergen in 1868, to Greenland in 1870, and to New Zealand in 1874—'75. The following contributions are from his hand:

Alger från Grönlands inlandsis, 1871.

Förteckning öfver kärlväxter och mossor från Grönlands-expeditionen 1870, 1871.

Bidrag till kännedom om fanerogam-floran vid Disko-bugten och Auleitsivikfjorden på Grönlands västkust, 1872.

Undersökning af mossfloran vid Disko-bukten etc., 1875.

Theodor Magnus Fries, son of Elias Fries, was born at Femsjö, Småland, Sweden, the 28th of October, 1832, received his Ph. D. degree in 1857, became docent the same year, was professor at

Digitized by Google

the university and director of the botanical garden in 1877—'99. He accompanied Nordenskiöld to Spitzbergen in 1868 and to Greenland in 1871. Some of his works which bear directly on North American botany are the following:

Lichenes Arctoi Europæ Grœnlandiæque hactenus cogniti, 1861.

Grönland, dess natur och invånare, 1872.

On the lichens collected during the English polar expeditions 1875—'76, 1879.

The botanical collections of these expeditions have been worked up by several other Swedish botanists. The principal of these are:

Jacob Georg Agardh. See page 25.

Frans Reinnold Kjellman. See page 32.

Carl Fredrik Otto Nordstedt was born at Jönköping, Sweden, the 20th of January, 1838, became conservator of the Botanical Museum at Lund in 1880, received the honorary degree of Ph. D. in 1881 and the title of professor in 1903. He has been for many years the editor of the "Botaniska Notiser". He has made extensive collections, and is an acknowledged authority on fresh-water algæ. He has published:

Desmideer samlade af Sven Berggren under Nordenskjöldska expeditionen till Grönland, 1870. 1885.

Ueber einige Characeen aus Porto Rico, 1888.

In 1876 began a series of expeditions to Greenland, undertaken to a great extent by the Danish government. The results of these expeditions have been printed in that excellent work which is known under the title

Meddelelser om Grönland.

The principal collectors on these expeditions were:

Andreas Nikolaus Kornerup, born at Copenhagen the 7th of February, 1857, became docent at the Agricultural College in 1880, and died the 3rd of September, 1881. He was the botanist of Steenstrup's expedition in 1876 and of Captain Jensen's in 1878—'79. His rich botanical collections were determined by Lange. He also contributed to *Meddelelser om Grönland.* The most important of these articles are:

Bemærkninger om Grönlands almindelige natur.

Om det organiske Liv paa den östlige Nunatak.

Knud Johan Vogelius Steenstrup was born the 7th of September, 1842, at Mov, Aalborg, took his pharmaceutical examination in 1863, became assistant in the Mineralogical Museum in 1866,

Digitized by Google

and has been since 1871 the geologist of the Danish explorations of Greenland. He received the honorary degree of Ph. D. in 1894. He made two expeditions to Greenland, one in 1876 to Julianehaab, and another in 1878—'80 to North Greenland. On the first Docent Kornerup was the botanist; during the second Steenstrup made the botanical collections himself.

Gustav Frederik Holm was born in Copenhagen in 1849 and became captain in the marine in 1885. He partook in the expedition under Steenstrup in 1876. He led an expedition to South Greenland in 1880—'81, and another to East Greenland in 1883—'85. He published,

Den Danske Konbaadsexpeditionen til Grönland, 1883—'85.

*C. Petersen**, Ph. Cand., was the botanist of the expedition to South Greenland in 1880 under CAPTAIN G. F. HOLM.

Jens Arnold Diderich Jensen was born at Flensborg the 24th of July, 1849, became captain in the marine in 1886, bureau-chief of the marine department in 1887, and retired in 1892. He made several journeys to Greenland: In 1877 to South Greenland, in 1878 to Godthaab and Fredrikshaab, in 1879, 1884 and 1885 to Holstenborg, Suckertoppen, and Godthaab. On the second of these journeys he was accompanied by Kornerup, and on the last by Dr. Sören Hansen, who acted as botanists. On the others he collected some plants himself.

N. Sylow, Ph. Cand., was the botanist of the expedition to North Greenland in 1879—'80 under LIEUT. R. HAMMER, and of that to South Greenland in 1883 under CAPTAIN HOLM.

P. Eberlin and *N. Knutson*, Ph. Cand., were the botanists of the expedition of 1883—'85, under CAPTAIN HOLM.

Carl Hartvig Ryder was born the the 12th of September, 1858, at Copenhagen, became lieutenant in the marine in 1879, and captain in 1897. He partook in Poulsen's expedition to Godthaab and Suckertoppen in 1885, made one to Upernavik in 1886, and another to the east coast of Greenland in 1891—'92, during which he himself made extensive botanical collections.

Johannes Eugenius Buelow Warming (See West Indies, page 48), and

* I have not been able to give any biographical sketch either of him or of several of the following collectors, as those volumes of *Meddelelser om Grönland* in which the account of their work published, are not found in the libraries of the City of New York.

Digitized by Google

Theodor Holm (See under United States, page 40) were th botanists on the Fylla expedition of 1884 under CAPTAIN NORMAN They visited the Disco-Godthaab district.

On the Fylla expedition of 1886, under CAPTAIN BRÆM, th botanists were J. L. A. K. ROSENVINGE (see below) and THEO DOR HOLM (see United States). They visited the districts o Upernavik, Pröven, Godhavn, Holstenborg, Suckertoppen, Godt haab, and Fredrikshaab.

Nikolaj Eg Krøse Hartz, M. A., was born at Randers, Den mark, the 23rd of August, 1867, and is an assistant in the Danis Geological Survey. He has had charge of several expeditions t Greenland, one to the Holstenborg, Fredrikshaab, and Tasermint districts in 1889, to Vaigattet and Holstenborg in 1890, and on to East Greenland in 1899—1902. From these he returned with many botanical specimens. During the last of these expeditions he was accompanied by KRUUSE as botanist.

Botanisk Rejse beretning fra Vest Grönland, 1894.
Östgrönlands Vegetationforhold, 1895.
Fanerogamer og Karkryptogamer fra Nordöst Grönland, 1895.

Johan Martin Christian Lange was born at Ödstedgaard, Fredericia, Denmark, the 18th of March, 1818, became docent in 1846, was director of the Botanical Garden in 1856—'76, and received the honorary degree of Ph. D. in 1877. He died in Copenhagen the 3rd of April, 1898. He continued after Hornemann the publication of

Flora Danica, of which he edited Vols. 15—17.

He became much interested in the flora of Greenland, determining most of the collections made there. He left several publications, of which the following may be mentioned:

Oversigt over Grönlands Planter, 1857.
Naturhistoriske Bidrag til en Beskrivelse af Grönland, 1857.
Synopsis of Greenland's flora, 1877.
Bemærkningar om de av Cand. Kornerup i 1878 samlede Planter paa Vestkysten av Grönland 1879.
Studier til Grönlands Flora, 1881.
Del Planter fra Nordgrönland, insamlede af Dr. Hansen, 1889.
Conspectus Floræ Grœnlandicæ in "Meddelelser om Grönland", Vol. 3.

This is by far the most important work that has appeared treating of the flora of Greenland. The first part appeared in 1880.

Digitized by Google

The contents of this publication is as follows:

Part I. Fanerogamer og Karsporeplanter:
[Introduction]—Lange.
Bemærkningar om Grönlands alminderlige Natur.—Kornerup.
[Systematic part.]—Lange.
Tillæg om grönlandske Plantenavne.—Rink.
Part II. Tillæg til Fanerogamerne og Karsporeplanterne.—Lange.
Grönlands Mosser.—Lange & C. Jensen.
Part III. Lichenes.—Deichmann-Branth & Grönlund.
Fungi.—E. Rostrup.
Marine Algæ.—Rosenvinge.
Andet Tillæg til Fanerogamer og Karsporeplanter.—Rosenvinge,

Carl Christian Hewitz Grönlund was born at Vordingsborg, Denmark, July 14, 1825, served as teacher at Haderlev College and as microscopist at Ny Carberg, Copenhagen, where he died August 10, 1901. He made a journey to Iceland in 1868 and another in 1876. He has published, besides his *Islands Flora* and the contributions to *Conspectus Floræ Grœnlandicæ*, also

Lichenes samlede i Grönland af *Prof. Fr. Johnstrup* i sommaren 1874, 1877—'78.

Fredrik Georg Emil Rostrup, born at Steensgaard, Lolland, Denmark, Jan. 28, 1831, became teacher at the Normal School at Skaarup, 1858, honorary Ph. D. in 1894, and professor in 1902. He contributed the part on fungi in the "Conspectus".

Tillæg til Grönlands Svampe, 1888.

Janus Lauritz Andreas Kolderup Rosenvinge was born at Copenhagen the 7th of November, 1858, became Ph. D. in 1888, docent at the University in 1895 and at the Polytechnic Institute in 1900. Besides his work on the *Conspectus Floræ Grœnlandicæ* mentioned above, we find, among other contributions:

Det sydligste Grönlands Vegetation, 1896.
Grönlands Halvalger, 1893.
Vegetation de la partie plus meridionale du Grönland, 1901.
Sur la vegetation d'algues marines sur les côtes du Grönland.
Nye Bidrag til Vest-Grönlands Flora. 1898.
Deuxieme memoir sur les algues marines du Grönland, 1900.
Om Algevegetationen ved Grönlands Kyster, 1900.

Jacob Severin Deichmann-Branth was born at Nykjöbing the 7th of December, 1831, was a minister by profession, and traveled in Germany and Italy. He, together with Grönlund, contributed the part on lichens in the *Conspectus Floræ Grœnlandicæ*.

Tillæg til Grönlands Lichen-Flora, 1892.

Digitized by Google

Ludwig Kumlien, the son of Thure Kumlien (see under United States, page 25), was born in Wisconsin, and died in 1902. Evidently he had inherited from his father the love of natural history. He was, however, more of a zoologist than a botanist, and was especially interested in birds. He was a field agent of the Smithsonian for a number of years and collected in Wisconsin and the New England States. He was the naturalist of the Howgate Polar Expedition in 1877—'78 to Cumberland Sound. The plants he collected were mostly from Niantilic Harbor, Annanactook, Kikkerton Island, and from the Island of Disco, Greenland. He published the report of the expedition, in which the plants were determined by Gray.

Contribution to the natural history of Arctic America, made in connection with the Howgate Polar Expedition, 1879.

Frans Reinhold Kjellman was born on Torsö, Västergötland, Sweden, the 4th of November, 1846, became Ph. D. and docent at the University of Upsala in 1872, and professor in 1883. He accompanied Nordenskjöld as botanist to Spitzbergen in 1872—'73, to Nova Zemlia and Siberia in 1875, and around the world in 1878—'80, during which journey they passed through the Behring Sea and visited Fort Clarence and the St. Laurence Island. He died at Upsala the 22nd of April, 1907. He was a prominent phycologist, and has paid attention especially to the algæ of the Arctic regions. Only a few of his works refer, however, to North American botany.

Fanerogam-floran på St. Lawrence-ön, 1883.

Om Behring-hafvets algflora, 1889.

Om Floride släktet *Galaxuara* [Species from Florida, West Indies, Mexico, etc.]

Algæ of the Arctic Sea, 1883.

Ernst Bernhard Almquist was born at Skogs-Tibbe, Upland, Sweden, the 10th of August, 1852, received his M. D. in 1882, and became professor at the Carolinian Institute at Stockholm in 1891. He was the physician and lichenologist of the Nordenskjöld expedition around Asia in 1878—'80.

Per Teodor Cleve was born at Stockholm the 10th of February, 1840, received his Ph D. in 1863, became docent the same year, and professor at Upsala in 1873. He is a prominent chemist and geologist, but also a botanist, having paid special atten-

Digitized by Google

ion to the diatoms, desmids and other fresh water algæ. He artook in a geological journey in 1868—'69 to North America nd the West Indies.

Diatoms from the West Indian Archipelago, 1878.
Diatoms collected during the expedition of the Vega.
Färskvattens diatomaceer från Grönland och Argentinska Republiken, 1881.
On the diatoms collected during the Arctic expedition of Sir George Nares, 1883.
Diatoms from Baffins Bay and Davis Strait, 1896.
Synopsis of the Naviculoid Diatoms, 1894.

Johan August Berlin was born at Malsta, Upland, Sweden, the 7th of August, 1851, received his degree of Ph. D. in 1888. He was the botanist of the Nordenskjöld expedition to Greenland in 1883.

Kärlväxter, insamlade under den svenska expeditionen till Grönland 1883, 1884.

Alfred Gabriel Nathhorst was born at Väderbrunn, Södermanland, Sweden, the 7th of November, 1850, took the degree of Ph. D. in 1874, and became docent the same year. He became professor and director of the Paleophytological Museum, Stockholm, in 1884. He has made journeys to Spitzbergen in 1870, 1882 and 1898, to Greenland (with Nordenskjöld) in 1883, and to East Greenland in 1899. He is a prominent paleontologist and phytogeographer.

Botaniska anteckningar från nordvästra Grönland, 1884.
Forssatta anmärkningar om den grönländska vegetationens historia, 1891.
Två somrar i Norra Ishafvet.

Johan Georg Robert Boldt was born at Kuopio, Finland, the 3rd of January, 1861, took his Ph. D. examinations in 1891, and has been instructor of geography and history at Björneborg since 1899. He is a specialist on algæ, especially the desmids.

Desmider från Grönland, 1888.

C. West Indies.

Albert Heinrich Riise was born the 11th of September, 1810, on Aerö, Denmark. He became apothecary on the island of St. Thomas, where he remained until 1870. He died the 18th of October, 1882. He made important collections, which are preserved at Copenhagen.

Digitized by Google

Henrik Johannes Krebs was born at Svendborg, Denmark, June 8, 1821. He took his pharmaceutical examination in 1840, and went to St. Thomas in 1843. He made several journeys to North, Central, and South America, to the Bermudas, Bahamas, Cuba, St. Domingo, Porto Rico, St. John, and St. Croix. In 1853 he became Swedish-Norwegian consul, and from 1860 he was first a member and then the speaker in the local legislature of the Danish West-Indies. In 1870 he returned to Copenhagen. He made considerble collections and published the following:

Et Bidrag til St. Thomas' Flora, 1847.
Catalogue of plants found on the island of St. Thomas, 1852.

Axel Theodor Goes was born at Rök, Östergötland, Sweden, the 3d of July 1835, served as government physician on St. Bartholomew 1865—70 and died at Stockholm Aug. 20, 1897. He made collections of West Indian plants.

Vegetationen på St. Bathelemy, skildrad i ett bref 1867. [Published by Th. M. Fries.]

Carl Conrad Berg was born in Copenhagen 1845. He was a machine worker by trade, came to St. Thomas in 1864. In 1867 he had charge of the dredging of the harbor at that place and in 1897 he became "Dock-master" for an English company. He came in contact with Baron Eggers and learned the scientific names from him. He has made an extensive collection of tropical woods, especially those of St. Thomas and St. John.

Frederik Michael Liebman (See Mexico, page 36).

Anders Sandö Örsted (See Mexico and Central America).

Baron Henrik Franz Alexander Eggers was born at the city of Schleswig, the 4th of December, 1844. He partok in the war of 1864. After the end of this war, he entered the service of Austria, followed Emperor Maximilian to Mexico, 1865—67, and was taken prisoner. After his release, he traveled for some time in Mexico. He went to St. Thomas in 1870 and entered the Danish service as a lieutenant, was advanced to captain and pensioned in 1885. He has lived in Copenhagen since 1887.

He visited San Domingo in 1880, Porto Rico in 1881 and 1883; Tortola, St. Kitts, San Domingo, Hayti, Turks Islands in 1887; Hayti, Jamaica, Bahamas in 1888; Cuba in 1889; Tabago, Trinidad, Grenada, St. Vincent and Barbados in 1889—90, Tab-

Digitized by Google

ago, Jamaica, Panama and Curaçao in 1891—93, and made extensive collections. The following publications are from his hand:

Erindringer fra Mexico, 1869.
St. Croix's Flora, 1876.
Rhizophora Mangle L., 1877.
Reynosia Griseb. En hidtil ufuldstandig kjendt Slægt af Rhamnaceernes Familie, 1877.
Naturen paa de Dansk-Vestindiske Öer. 1878.
The Flora of St. Croix and the Virgin Islands, 1879.
Et Besög paa Öen Dominica, 1880.
Die Poyale des östlichen Porto Rico, 1882.
Portọ Rico, 1883.
Reise in das Innere von Sto. Domingo, 1888.
Flora of the Bahamas, 1892.
Supplement til St. Croix's og Jomfruöernes Flora, 1889.
Botanical Exploration to Cuba, 1890.
Die Insel Tobago, 1893.

Veit Brecher Wittrock (See United States and Canada, page 26).

Carl Emil Hansen Ostenfeld (See Greenland and Arctic America, page 45).

Carl Fredrik Otto Nordstedt (See Greenland, page 28).

William Nylander was born at Uleåborg, Finland, Jan. 3, 1822, received the degree Ph. Cand. in 1843 and that of M. D. in 1847. He lived in France from 1851 to 1857, when he was appointed professor at the University of Helsingfors, Finland. He returned to France in 1863 and died in Paris the 29th of March, 1899. He was perhaps the most prominent lichenologist of the world and was the author of numerous publications. Those relating to North America are the following:

Synopsis methodica Lichenum omnium hucusque cognitorum, 1858—'59.
Collectio lichenum ex insula Cuba, 1866.
Enumeration des Lichenes récoltés par M. T. Husnot aux Antilles francaises, 1868.
Circa Pyrenocarpeos in Cuba collectos a C. Wright, 1876.
Lichenes nonnulli insulæ St. Thomas Antillarum, 1880.
Enumeratio lichenum Freti Behringii, 1888.
Mexicanas plantas nuper a colletoribus expeditionis scientificæ [together with E. Fournier and E. Bescherell].
Lichenes exotici a W. Nylander descripti 1892.

Nils Gustaf Lagerheim was born at Stockholm the 18th of October, 1860. In 1889 he became conservator at the museum at

Digitized by Google

Lisbon; from 1889 to 1892 he was at Quito, 1892—5 at Tromsö Norway, and in 1895 became professor at Stockholm. He ha specialized in the lower cryptogams, especially the Desmids. Th following contributions bear on American Botany.

Bidrag till Amerikas desmidieflora, 1885.

Ueber einige Arten aus Cuba, Jamaica und Puerto Rico. [Desmids found i material collected by Sintens, Swartz, and Wright], 1887.

Sur un nouveau parasite dangereoux de la Vigne, *Uredo Vialæ* in Jamaica 1889.

Mykologische Studien, 1899.

D. Mexico and Central America.

Frederik Michael Liebman was born at Helsingör, Denmark, th 10th of October, 1813, made journeys in Germany 1835, and in Norway 1836, and became docent at the University of Copenhagen in 1837.

In 1840 he started for Mexico in company with Rathsack, a gardener, and arrived at Vera Cruz in February, 1841. Here he met the Russian botanist Karwinsky, and they traveled together for some months. He visited several places north of Vera Cruz, as for instance Antiqua, Colima, Misantla and as far north as Papantla. Then he turned south and after having visited several places he stayed for a considerable time at Hacienda Mirador on the eastern slope of Mount Orizaba. This mountain he climbed in company with the German botanist Ghiesbrecht. Then he visited Tehuacan and returned to Mirador. Rathsack returned to Denmark in 1842 with numerous boxes of herbarium specimens, samples of woods, fruits, seeds and living plants. Liebman himself undertook a journey southward, visiting the city of Orizaba, Cuicatlan, Oaxaca, etc., climbed the peaks of Zempoaltepec and El Pelado, visited among other places, San Pedro Alto, Huamamelula and even Tehuantepec, and on his return again Oaxaca and Mirador.

On the home journey from Vera Cruz, he stopped two or three weeks in Cuba. He died the 29th of October, 1856, as professor at the University of Copenhagen.

Liebman did not have time before his death to publish much from the results of these collections. Most of this fell on the shoulders of Örsted. Still the following important contributions are from Liebman's hands.

Digitized by Google

Mexicos Brægner, 1849.
Mexicos og Central-Americas Neldeagtige Planter (*Urticeæ*), 1851.
Mexicos Halvgræs (*Cyperaceæ*), 1850.
Les chênes de l'Amerique tropale (*posthumous*, edited by Örsted), 1869.

Liebman also contributed to *Flora Danica*, of which he edited the 14th and 15th volumes and a supplement.

Anders Sandöe Örsted was born at Rudkjöping, Denmark, the 21 of June, 1816, began teaching in 1837, took his M. A. degree in 1844 and the Ph. D. in 1854, was appointed docent in 1851, received the title of professor in 1860 and became full professor in 1865. He died the 3rd of September, 1872.

He made a botanical journey to the West Indies and Central America in 1845—48. His stay in the West Indies was rather short. Besides the Danish West Indies, he visited also Jamaica, where he stayed six weeks. Örsted was one of the most productive botanists, and the mere list of his publications would occupy half a dozen pages. The following contains the most important publications bearing on American botany.

Ein Reise i Guanasti i Costa Rica, 1849.
Naturens physionomie i Central America, 1849.
Central Americas Rubiaceer, 1852.
Compositæ centroamericanæ [together with Bentham], 1852.
Geographisk-statistisk Oversigt over Central-Americas Compositeer, 1852.
Leguminosæ centroamericanæ, 1853.
Scrophularinæ centroamericanæ, Labiatæ do. and Malpighiaceæ do. [together with Bentham], 1853.
Gentianeæ centroamericanæ [together with Grisebach], 1853.
Mexicos og Central-Americas Acanthaceer, 1854.
Myrtaceæ centroamericanæ [together with D. O. Berg], 1855.
Om det centralamerikanske Balsamtræ og Balsamkysten, 1856.
Plantæ novæ centroamericanæ, 1856.
Centralamerikas Lobeliaceer [together with Planchon], 1857.
Plantæ novæ centroamericanæ, 1857.
Centralamerikas Gesneriaceer, 1858.
Palmæ centroamericanæ, 1858.
Myrsineæ centroamericanæ et mexicanæ, 1861.
L'Amerique centrale, 1863.
Skildring af Naturen paa Jamaica, 1863.
Det centralamerikanska ambratræ, 1870.
Præcursores floræ centroamericanæ (*posthumous*), 1873.

Jacob Georg Agardh (See above).

Digitized by Google

7. ENGLERIAN PERIOD, 1889——.

In 1889 appeared the first fascicle of Engler and Prantl's *Natuerlischen Pflanzenfamilien*, and three years later Adolph Engler's *Syllabus*. The former [not yet completed] gives an an extensive account of all families and genera of plants, not only the flowering plants, as the *Genera Plantarum* of Bentham and Hooker and their predecessors. It was in this that the Englerian system of classification was first used, and it was in the *Syllabus* that it was first given in full. The Englerian system differs mainly from those of Bentham and Hooker and of deCandolle in the fact that Engler begins with the lower plants and advances from lower to higher forms, while the other systems begin with some of the higher families and proceed to the more simple ones. The names of the families are in most cases retained, but their relative position in many instances considerably changed. As the general arrangement of families and genera is much more natural than in other systems, Engler's system is now adopted at the leading institutions of this country. In individual cases the arrangement could be improved, and in some cases it is not as good as in the two preceding systems.

About the time that this system was made public, the two leading botanists of this country passed away, A. Gray in 1888, and S. Watson in 1892. This in itself might have been regarded as the end of a period, for the prominence of especially the former had been so great that the work of almost everyone else had been overshadowed. Now came a period of general comradeship and good-feeling, in which the tendency is: "Let also the smaller lights shine." To mention all the workers during the last eighteen years would be impossible, and it would be without the scope of this paper. During this period not only the Scandinavians on the other side of the Atlantic have taken an active part in American botany; there has grown up also a set of men in this country who have made no small contribution to the knowledge of North American botany, consisting partly of Scandinavians who in younger days immigrated, and partly of the sons of immigrants.

A. United States and Canada.

a. SCANDINAVIANS.

Nils Conrad Kindberg was born at Karlstad the 7th of August, 1832. He took his Ph. D. degree in 1857, and became lector at the College of Linköping 1860—1900. He is one of the leading bryologists in the world. He is a productive writer. The publications relative to North American botany given below (and this list is very likely not complete) can not by any means be compared in number with the works on Old World bryology.

Enumeratio muscorum qui in Grœnlandia, Islandia et Færoer occurrunt, 1888.

Bidrag till kännedom om Canada-områdets mossflora, 1890.

Checklist of European and North American Mosses (*Bryineæ*), 1894.

New or less known species of Pleurocarpous Mosses from North America and Europe, 1895.

Digitized by Google

New or less known species of Acrocarpous Mosses from North America and Europe, 1896.
European and North American Bryineœ, 1896—'98.
Genera of European and North American Bryineæ, 1897.
Mousses recoltées an Alabama, 1898.
Musci in J. Macoun, Catalogue of Canadian Plants, 1892.
European and North American *Polytrichaceæ*, 1894.
Notes sur un Hypopterygium in Canada, 1899.
Addition to the North American and European Bryology, 1900.
Bemerkungen über Nordamericanische Laubmoose, 1903.
New North American Bryineæ, 1905.

Johan Nordal Fischer Wille was born at Skjolden Haaböl, Norway, the 28th of October, 1858, received his degree of Ph. D. in 1885, became amanuensis at the Natural History Museum at Stockholm in 1883, professor at Stockholm in 1886, and professor at the University and director of the Botanical Garden of Christiania in 1893. He is a prominent phycologist, and has published considerably, but rather little that refers specially to American botany for instance:

New Forms of Green Algæ, 1899.
Studien über Chlorophyceen, 1901.
Algologiska notiser, 1903.

Johan Ivar Lindroth was born at Sibbo, Nyland, Finland, took his examination for the Ph. D. degree in 1903 and has been since 1902 teacher of Natural History at the Forestry Institute at Evo, Finland. He is specialist on parasitic Fungi. The following publications contain some North American species.

Mycologische Notizen, 1900.
Uredineæ novæ, 1901.

Carl Christensen, Ph. Cand., assistant in the Botanical Museum at Copenhagen, is an ardent fern student. He has served the world by issuing his *Index Filicum*, a work which is to the pteridologist what the Kew Index is to the phanerogamic systematist. It is even in many respects superior to the Kew Index, especially in the matter of citing synonyms. As yet, Mr. Christensen has published but little referring to American Botany. Of these the most important are:

American species of Leptochilus section Bolbitis, 1904.
Index Filicum, 1905.

b. Scandinavian-Americans.

August Gustaf Eisen was born at Stockholm, Sweden, the 2nd of August 1849, received his degree of Ph. D. in 1872 and became

Digitized by Google

docent in Zoology at Upsala the same year, but emigrated to America. He is a prominent zoologist, has made several journeys to Mexico and Central America, and collected botanical as well as zoological specimens. He is a member of the California Academy, whose President he was in 1905.

Explorations to the Cape Region of Baja, California, 1894—'95.
Biological Studies of Figs, etc., 1896.

Herman Theodor Holm was born the 3rd of February, 1854, at Copenhagen. He was the naturalist of the Danish North Pole Expedition of 1881—82 and accompanied Warming to Greenland in 1884 and Rosenvinge in 1886. In 1888, he emigrated to America, and became assistant botanist of the United States Department of Agriculture, 1893—96. He is a specialist in anatomy and morphology of flowering plants. He received his Ph. D. degree in 1902. He has published many papers on plant anatomy. The following are some of those referring more especially to North American botany:

Contribution to the Flora of Greenland, 1896.
Catalogue of Plants Collected by Messrs. Schubert, Stein, and White on the East Coast of Baffin's Land and the West Coast of Greenland, 1900.
Allies of *Stellaria media*, 1901.
Biological Notes on Canadian Species of *Viola*.
On Some Canadian Species of Gentians, 1901.
On the genus *Arctophila* Rupr., 1902.
Studies upon Cyperaceæ, I—XXIV, 1896—1905.

John H. Sandberg was born the 24th of July 1848, at Broby, Skåne, Sweden. He received his college education at Lund and also studied pharmacy in Sweden. He came to America in 1868 and located at Minneapolis in 1887. He studied medicine in this country has been practicing at Jenkins and Minneapolis, Minnesota. He is an enthusiastic collector and brought together a large herbarium of Minnesota plants, which some years ago was secured by Gustavus Adolphus College at St. Peter, Minnesota. In 1892 he became a field agent of the division of botany, United States Department of Agriculture, and collected in company with D. T. MacDougal and A. A. Heller, in Northern Idaho and adjacent Washington and Montana, and the following year in company with John B. Leiberg in the same region.

John B. Leiberg, was born the 7th of October, 1853 at Malmö Skåne, Sweden, where he graduated from the Gymnaseum, arrived

Digitized by Google

in America in 1868, and settled in 1880 near Lake Coeur d'Aleen, Idaho. He accompanied Dr. Sandberg on his second botanical expedition to the mountains of Idaho in 1893, acted as field agent for the Botanical Division of the United State Department of Agriculture the summers of 1895 and 1896, and collected in Idaho, Washington, Nevada, and Oregon. In 1897, he became connected with the United States Geological Survey, up to 1903, and in 1905—6 carried on investigations in reference to the timber supply of the Forest Reserves of Montana, Idaho, Oregon, California and Arizona and was Forestry Inspector in the Philipines in 1904—5. The following publications are from his hand.

Contributions to the Flora of Iowa, 1870.
Contributions to the Upham's Flora of Minnesota, 1880.
General Report on a Botanical Survey of the Coeur d'Alene Mountains in Idaho, 1895.
Delphinium viridescens and *Sambucus leiosperma*, 1897.
The Bitterroot Forest Reserve, 1899.
The Priest River Forest Reserve, 1899.
Forest Conditions in the Northern Sierra Nevada, California, 1902.
Forest Conditions in the San Francisco Mountains Forest Reserve, Arizona [with T. F. Rixon and A. Dodwell].

Aven Nelson was born at Keokuk, Iowa, the 24th March, 1859, his parents being Norwegians. He received his degree of M. S. in 1890, A. M. 1892, and Ph. D. 1904. He has been professor of biology at the University of Wyoming since 1887. He is a prominent systematic and economic botanist, has made extensive collections in the Rocky Mountain region, especially in the state of Wyoming, and has built up the largest herbarium found within the Rocky Mountain states. He is one of the most prolific writers on systematic botany, and hundreds of new species have been described by him. The following are the most important of his publications:

First Report on the Flora of Wyoming, 1896.
The Worst Weeds of Wyoming, 1896.
New Plants from Wyoming, I—XV, 1898—1904.
Rocky Mountain Species of *Thermopsis*, 1898.
The Trees of Wyoming and How to Know Them, 1899.
The Western Species of *Argallus*, 1899.
New Species of *Oreocarya* and its Allies, 1899.
Some Species of *Tetraneuris* and its Allies, 1899.
Some Notes on the Flora of Yellowstone National Park, 1899.
Som Native Forage Plants on Alkali Soil, 1899.

Digitized by Google

Some Rocky Mountain *Chrysothamni*, 1900.
Cryptogams of Wyoming, 1900.
Contributions from the Rocky Mountain Herbarium, I—VII, 1900—'06.
Broom-grasses of Wyoming, 1901.
An Analytical Key to Some of the Common Plants of the Rocky Mountain Region, 1902.
The Genus *Hedysarum* in the Rocky Mountains, 1902.
Native Vines in Wyoming Homes, 1902.
Psilostrophe, a Neglected Genus of Southwestern Plants, 1903.
The Wheat-grasses of Wyoming 1903.
Plantæ Andrewsianæ, 1904.
New Plants from Nevada, I—II, 1904—'05.
Plantæ montrosenses, I [together with Kennedy], 1906.

Per Axel Rydberg was born the 6th of July, 1860, in Ohd Parish, Westergötland, Sweden, and studied at the Royal Gymnasium at Skara, where he was graduated in 1881. The following year, he emigrated to America. From 1884—1893 he taught at Luther Academy, Wahoo, Neb. He received his M. A. degree at the University of Nebraska in 1895 and his Ph. D. at Columbia University, New York, in 1898; was professor of natural sciences and mathematics at Upsala College, Kennilworth, N. J., 1895—6 and 1897—9, and is since that time one of the curators of the New York Botanical Garden. In the summers of 1891—93, 1895, and 1896 he was a field agent of the United States Department of Agriculture and collected in western Nebraska, the Black Hills of South Dakota, Montana, Idaho, Wyoming and Colorado. In 1897, 1900, and 1905 he collected for the New York Botanical Garden in Montana, Colorado, California, and Utah. The list of his publications is omitted for obvious reasons.

List of Papers Published by Dr. P. A. Rydberg.*

On the American Black Cottonwood, 1893.
Flora of Nebraska. Part 21, Rosales, 1895.
New species of *Physalis*, 1895.
Flora of the Sandhills of Nebraska, 1895.
Flora of the Black Hills of South Dakota, 1896.
The North American species of *Physalis* and related genera, 1896.
Notes on *Potentilleae.*, I—VI, 1896—7.
Notes on two western plants, 1897.
Antennaria dioica and its North American allies, 1897.
Rarities from Montana, 1897.

* *Editor's Note.* This paper would be lacking in a most important particular, if the writings of its author were omitted. The editor, for that reason, takes the liberty to here insert as complete a list as he has been able to secure of the published papers of Dr. P. A. Rydberg to the present date. J. A. UDDEN.

Digitized by Google

Report on the grasses and forage plants of the Rocky Mountain region, (together with C. L. Shear), 1897.

A monograph of the North American Potentilleae, 1898.

The cespitose Willows of Arctic America and the Rocky Mountains, 1899.

Delphinium carolinianum and related species, 1899.

New species of the western United States, 1899.

An annotated catalogue of the Flora of Montana and the Yellowstone National Park, 1900.

What is *Prunus insititia?* 1900.

Composition of the Rocky Mountain Flora, 1900.

Studies of the Rocky Mountain Flora, I—XVII, 1900—7.

The American species of *Limnorchis* and *Piperia*, 1901.

Further notes on the *Potentilleae*, 1901.

Is the Whitefruited Strawberry of Pennsylvania a native species? 1901.

The North American Twinflowers, 1901.

The Oaks of the Continental Divide north of Mexico, 1901.

Our yellow Lady's-Slippers, 1902.

A new station of *Isotria affinis*, 1902.

Some generic segregations, 1903.

Explorations in Utah, 1905.

Penthoraceae (in the North American Flora), 1905.

Parnassiaceae (in the North American Flora), 1905.

Astragalus and segregates as represented in Colorado, 1905.

Saxifragaceae (in the North American Flora, together with J. K. Small), 1905.

Hydrangiaceae (in the North American Flora, together with J. K. Small), 1905.

Flora of Colorado, 1906.

Julius Hjalmar Flodman was born the 23rd of September in Heda Parish of Östergötland, Sweden. While he was a small boy, his father emigrated to America in 1868 and settled in Polk County, Nebraska. Flodman graduated at Augustana College, Rock Island, Ill., in 1890, and received the degree of A. M. in 1900, has been teaching at Luther Academy, Wahoo, Neb., since 1890, except one year, when he attended the University of Nebraska. He accompanied the writer on two of his botanical expeditions, viz. to western Nebraska in 1891, and Montana in 1895, and distributed sets of herbarium specimens collected on the last mentioned expedition.

Alexander Pierce Anderson was born at Red Wing, Minnesota, his parents being Swedish. He received his degree of A. M. in 1895 and of Ph. D. in 1897. He was botanist and bacteriologist at Clemson College, S. C., 1897—9, assistant professor of Botany at

Digitized by Google

the University of Minnesota, 1899—1900, biologist and entomologist at Clemson, 1900—1. He is the inventor of the famous "Puffed Rice" and other starchy products. He is now the botanist and experimental chemist of a company, which is engaged in developing his discoveries and inventions. The following systematic and economic papers are from his hand:

Diseases of Plants, 1898.
A New *Tilletia* parasitic on *Orysa sativa*, 1899.
Rice Blast and a New Smut on the Rice Plant, 1899.
Tilletia horrida Tak. on Rice Plant in South Carolina, 1902.
Dasyscypha resinaria, causing the canker growth on *Abies balsamea*, 1902.

Philip Dowell was born at Attica, Indiana, the 3rd of December 1864, his father being a Swedish-American clergyman. He received his degree of A. B. in 1885, A. M. in 1895, and Ph. D. in 1900, taught at Augustana College, Rock Island, Ill., in 1889—90; at Hope Academy, Minnesota, in 1890—1; at Upsala College, Brooklyn, 1896—7; was professor of sciences at Muhlenberg College, Allentown, Pa., in 1896—1902; was botanical assistant at the United States National Museum in 1902; and is now instructor in the New York High Schools since that year. He is a zoologist as well as botanist. The following botanical publications are from his hand:

Addition to the Flora of Staten Island, 1905.
Botanical Notes, 1906.
Distribution of Ferns on Staten Island, 1906.
North American Species of *Calceolaria*, 1906.
Observations on the Occurrence of Boott's Fern, 1906.

Elias Nelson was born in Sweden, Sept. 7th, 1876, came as a boy to America, studied at the University of Wyoming, were he took his M. A. degree in 1899. He was a pupil of Prof. A. Nelson. He has been a scientific aid in the U. S. Department of Agriculture in 1900, and assistant in Horticulture and Agrostology at the University of Wyoming in 1901—5, and is now the superintendent of the Experimental Farm at Bend, Oregon, since 1905. He has made extensive collections, especially in Wyoming and neighboring states. He has made a speciality of grasses and forage plants.

Revision of the Western North American Phloxes, 1899.
Some New Western Species, 1899.
Some new species of Wyoming Plants, 1900.
Shrubs of Wyoming, 1902.
Notes on certain species of *Antennaria* 1902.

Digitized by Google

Some Western Species of *Agropyrum*, 1902.
Native and Introduced Saltbushes, 1904.

Carl Otto Rosendahl was born the 24th of October at Spring Grove, Minnesota. His parents were Norwegians. He graduated at the University of Minnesota in 1901; was instructor in botany at the same institution, 1901—2; and took his Ph. D. at Berlin, Germany, in 1905. He has paid special attention to the flora of Minnesota. He has published the following:

An Addition to the Knowledge of the Flora of Southeastern Minnesota, 1903.
Die Nordamerikanischen *Saxifragineæ*, 1903.
Observation in Plant Distribution in the Renfrew District of Vancouver Island.

Pehr Hjalmar Olson-Seffer was born at Ekenäs, Finland, the 14th September, 1873, became instructor in Swedish at Mariehamn College in 1896 and of botany at Helsingfors College in 1896, made a journey to Australia and migrated to America in 1903. He became instructor in systematic botany at Leland Stanford University in 1903, and received his Ph. D. in 1904. In 1905, he made a journey to Central America and in 1906—7 a journey around the world, in order to study rubber-culture and tropical agriculture. His specialty is Phytogeography and Economic Botany. He was for a short time the director of La Zaculpa Botanical Station and Plantation in Chiapas, Mexico, and was lately appointed Governmetal Comissioner of tropical agriculture of Mexico. He is the editor of the department of tropical agriculture in the Mexican Investos.

Mexico — Rubber Experiment Station Prospectus, 1906.

Ivar Tidestrom was born the 13th of September, 1865, in the Province of Nerike, Sweden, and came to America in 1881. From 1890—5, he was a student and assistant of Prof. E. L. Greene, at the University of California, and later at the Catholic University of Washington, D. C., where he received his Ph. B.

Notes on *Botrychium virginicum*, 1905.
Notes on the Gray Polypody, 1905.
Elysium marianum [Ferns and Fern-allies of Maryland and Virginia].

J. Lunell was born at Kalmar, Sweden, the 30th of March 1851, received his license to practice medicine in Dakota in 1889, and is now a practicing physician at Leeds, North Dakota. He has made extensive botanical collections in Dakota and in Oregon. A few new plants discovered by him have been described by Prof.

Digitized by Google

A. Nelson. As far as the writer knows, the only botanical paper he has published is

The Genus *Alisma* in North Dakota, 1907.

O. M. Oleson was born near Drontheim Norway, where he also learned gardening. He came to America and settled at Fort Dodge, Iowa, in 1870, and two years later entered a drug store. In 1876—77 he attended the College of Pharmacy at Philadelphia, where he graduated. He has collected considerably in Iowa, and in 1904 in the Yellowstone Park and in 1906 in California. He is the Chairman of the Board of Park Commissioners of Fort Dodge, Iowa.

Flora of Webster Co., Iowa, [together with M. P. Somes] 1905.

B. Greenland and Arctic America.

Johan Alfred Björling was born in Stockholm the 19th of October, 1871. He was the botanist of two arctic expeditions, viz. one to Spitzbergen in 1890; the other to Arctic America, in 1892. While engaged in this expedition, he died on Ellesmereland (west of Greenland).

Frederic Christian Emil Börgesen. (See West Indies).

Christian Krause was born at Lillio, Korsör, Denmark, the 6th of June, 1867, received the degree of M. Sc. in 1895, and became adjunct professor at the College of Randers. He made one journey to West Greenland in 1897, and another to East Greenland in 1899—1902.

List of Fanerogams and Vascular Cryptogams found on the Coast 75°—66° 20′ Lat. N. of East Greenland, 1905.

Morten Pedersen Porsild was born at Store Andst, Jylland, Denmark, in 1872, became assistant in the Botanical Museum at Copenhagen in 1895, received the degree of M. Sc. in 1900 and became director of the Arctic Botanical Station at Godhavn, Greenland, in 1905. Before that time he made two journeys to Greenland, viz. in 1893 and 1902. He has published:

Bidrag til en Skildring paa Disco, 1902.

O. Gelert was born at Nybol, Sundeved, Denmark, November 9, 1862. He took his Phar. Cand. examination in 1883, served for some time as druggist, and was later employed in a sugar-refinery.

Digitized by Google

This place he was forced to leave on account of poor health. He then received a position in the Botanical Museum at Copenhagen. Here he worked especially on the arctic collection together with Ostenfeld. Their aim was to publish an Arctic Flora. The work has been continued by Ostenfeld, and the first fascicle has been published. In 1897, Gelert made a journey to the Canary Islands. He died the 20th of March, 1899, at Copenhagen.

Notes on Arctic Plants, I [Crucifers], 1897.

Per Dusen was born at Wimmerby, Sweden, the 4th of August, 1855. He is a civil engineer by profession and has made the following journeys, mostly in the interest of botany: to Kamerum in 1890—2, Terra del Fuego in 1896—7, East Greenland (with Nathorst) in 1899, and Patagonia 1904—5. He is an amanuensis at the Museum of Rio Janeiro since 1901.

Beitrage zur Laubmoosflora Ostgrönlands und der Insel Jan Mayen, 1901.
Några viktiga växtfynd från nordöstra Grönland, 1901.
Zur Kentniss der Gefässpflanzen Ostgrönlands, 1901.

Herman Georg Simmons was born at Dalby, Skåne, Sweden, the 16th of August 1866, became Ph. Cand. in 1892, and amanuensis at the Botanical Museum at Lund in 1893. He was the botanist of Sverdrup's expedition to Ellesmereland (west of Greenland) in 1898—1902. The following are his publications:

Preliminary Report on the Work of the Second Norwegian Polar Expedition 1903.
Flora of Ellesmereland, Part I, 190...

Carl Emil Hansen Ostenfeld was born at Randers, Denmark, August 3rd, 1873. He has been inspector of the Botanical Museum at Copenhagen since 1900. He has made as his specialty the study of the flora of arctic regions. The following publications referring to America are from his hand:

Om inslæbte Planter fra Ivigtut (Syd Grönland), 1902.
Flora Arctica, Part I, 1902.
Halophila Aschersonii [native of St. Croix], 1902.

Hugo Gustaf Adolf Dahlstedt was born at St. Lars, Östergötland, Sweden, the 8th of February, 1856, became amanuensis at the Botanical Garden at Stockholm in 1890 and at the Botanical Museum in 1892—4. He is a specialist on several Cichoriaceous genera, especially *Hieracium*. He has furnished some contributions to the knowledge of the North American Flora. He wrote

Digitized by Google

the manuscript of the genus *Hieracium* for the *Conspectus Florae Groelandicae*.

Studien über süd-und centralamerikanische Peperomien, 1900.
Studier öfver arktiska *Taraxaca*, 1905.
Arktiska och alpina arter inom formgruppen *Taraxacum ceratophorum*, 1906.

C. West Indies.

Johannes Eugenius Bælow Warming was born on Manö, Jylland, Denmark, the 3rd of November, 1841, received the degree Ph. D. in 1871, became docent at the University of Copenhagen in 1874, at Stockholm, 1882—6, and was appointed professor and director of the Botanical Garden at Copenhagen, in 1887.

He undertook in 1863 a journey to Brazil, where he remained for three years. The book published on Lagoa Santos after his return home, placed him at once as one of the leading phytogeographers of the world. In 1884 he and Theodor Holm joined the Fylla Expedition to Greenland, and in 1891 and 1892 he undertook a botanical exploration of the West Indies and South America. He was accompanied by Holger Jörgen Lassen, and Mr. Levissen, a forester, and visited Barbados, Trinidad, Venezuela, Porto Rico, and the Danish West Indies. During these travels of his he gathered extensive material and knowledge, which he used in his phytogeographical and ecological works. He drew also from the work done in the West Indies by Börgesen and Paulsen. The works that treat more or less of the North American Flora are the following:

Biologiske Optegnelser om Grönlændske Planter, 1886—'90.
Halophytstudier, 1897.
On the Vegetation of Tropical America, 1899.
Familjen *Podostemaceæ*, 1881—1901.
Om nogle arktiske Væxters Biologi, 1886.

Holger Jörgen Lassen was born at Copenhagen, July 10th, 1868, and received the degree Ph. Cand. in 1887. He partook in the Greenland Expedition of 1890, and accompanied Prof. Warming on his journey to the West Indies and Venezuela in 1891—2. He died, October 3rd, 1897. He has publishid some smaller articles on tropical America, and besides

Momenter af Västindiens geografi.

Digitized by Google

Frederik Christian Emil Börgesen was born at Copenhagen, Jan. 1st., 1866, received his Master's degree in 1891, and became librarian of the Botanical Garden in 1900. He has made several journeys in Sweden, Denmark and Norway and has made a specialty of the fresh-water algae, especially the Desmids. He made two visits to the Danish West Indies, one in 1893, the other in 1895—6, together with O. Paulsen. Here he studied especially the marine algae. He has published the following papers:

Ferskvandsalger fra Östgrönland, 1894.
Om Vegetationen paa de dansk vestindiske Öer [with O. Paulsen], 1898.
La Vegetation des Antilles Danoises [together with O. Paulsen], 1900.
Vore vestindiske Öer, 1900.
A Contribution to the Knowledge of the Marine Algœ Vegetation on the Coast of the Danish West Indies [also in Danish], 1900.

Ove Vilhelm Paulsen was born at Aarhus, Denmark, March 22nd, 1874. He made several shorter journeys in Denmark and Norway, and went with Börgesen to the West Indies in 1895—6. In 1897, he received his Master's degree and in 1898—9 he partook in the expedition to Pamir under Lieutenant Olufsen. He became assistant at the Botanical Garden in 1900. Together with Börgesen he published:

Om Vegetationen paa de Dansk-Vestindiske Öer, 1898.

Carl Emil Hansen Ostenfeld. (See under Greenland and Arctic America, page 47).

Carl Olav Ernst Hansen was born at Ölstycke, near Copenhagen, the 7th of June, 1865. He was a gardener by trade; came in 1885 to the Botanical Garden at Copenhagen; made a journey to France in 1888, where he was employed for some time at Jardin des Plantes. In 1892 he was offered to go to the West Indies and eventually take charge of an Experimental Station which was contemplated. He visited Barbadoe, Jamaica, Domingo, and St. Lucia, where he studied the botanical gardens and sugar plantations. He made collections of plants, which he sent to Copenhagen.

Mexico and Central America.

August Gustaf Eisen (See United States, page 39).

Pehr Hjalmar Olson-Seffer (See United States, page 45).

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google